

GPRS BASED VEHICLE TRACKER IN NETWORK SYSTEM

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ABSTRACT

We can implement vehicle location tracking use GPRS vehicle positioning terminal to surf the Internet, combine Internet technology and GIS technology. The article gives the design structure of GPRS vehicle positioning network service system. The system is divided into three parts: GIS network workstation, network communication server and GPRS vehicle positioning terminal. Then, the article briefly introduces three functions of the system: GIS network the workstation is responsible for sending commands "Set GPS location data return interval" is network communication server, receiving GPS location data package uploaded by GPRS vehicle the positioning terminal from the network communication server, analyze the received GPS positioning data packets; The vehicle will appear as a title in the designated positioning on the map combined with GIS. The internet the communication server is responsible for receiving command from the GIS network workstation and transfer to designated GPRS vehicle positioning terminal and receiving GPRS support GPS positioning data packet transmission vehicle positioning terminal and distributed to appropriate GIS network workstation. GPRS vehicle positioning terminal is responsible receive the command "Set GPS location data return interval" sent from network communication server and send GPS location data collected by GPS module to network communication server. At last, the article passes the feasibility of the test system design experiment. By using this system, it will become easy and fast to make the location of the vehicle tracked on the Internet in real time and access the vehicle location information.

KEYWORDS: GPRS, GIS, Vehicle Location, Internet & Terminal

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INTRODUCTION

PREFACE

GPRS vehicle positioning application technology started in developed countries, such as Europe and America in the late 1980s it has been 20 years. Vehicle positioning method using GPS technology for management can bring huge convenient, fast and economical vehicle use management unit, multiple vehicles management units and departments cannot execute it's working properly without it. GPS has always been popular and widely used in vehicle positioning and so, this article designs a GPRS vehicle positioning network service system and discussed brief description of each function to prove the feasibility of the system through experimental design.

GPRS VEHICLE TRACKER NETWORK SYSTEM

GIS network workstations, network communications server, and GPRS vehicle location terminal are the three crucial components of the tool.

A) GIS Network Workstations

GIS network workstation combined with GIS is Client-based man-machine interface program internet

communication. GIS network workstation considered as a client of network communication. The server has 2 SOCKET communication links based on intranet communication server, and uses TCP protocol for Internet transmission. One is used to send the command "Set GPS location data return interval" to network communication server, another for receiving GPS location data packets from the network communication server. Finally, GIS community workstations take a glance at of acquired GPS place information, the exact location of the vehicles are determined on the map with the beneficial aid of the utilization of mixing with GIS.

B) Network Communications Server

Network communications server is that the center of the complete system, it consists of 3 sub-services, and they are SOCKET communiqué services primarily based on TCP protocol. The number one sub-system IS command-receiving system which receives the placing command dispatched from GIS network workstations; the second sub-system is real-time GPS location detail distribution services which sends GPS location detail packet to GIS network workstations. The last sub-system is GPRS registration code terminal communiqué system which communicates with GPRS registration code terminal, and sends placing command to GPRS registration code terminal, at the same time as receives GPS location detail packet delivered through GPRS registration code terminal.

C) GPRS Vehicle Location Terminal

GPRS vehicle area terminal is GPS area terminal introduced within the vehicle and based on GPRS module communications, it incorporates GPRS communication module, GPS area module and integrated circuit sheets interior, GPRS radio wire and GPS receiving wire exterior. GPRS module is connected to Internet through CMNET. It is acts as client of network communications server, and gets the setting command sent from arrange communications server based on Attachment of TCP convention, and sends simultaneously GPS area information collected from GPS module to the arrange communications server.

SYSTEM PRINCIPLES

The following is running standards for elements of the system.

A) GIS Network Workstations

To begin with, we initialize two Attachment based on TCP protocol in GIS organize workstations program, the one Attachment sends connection request to setting command by means of communication server program port with indicated Web IP address .The other Attachment sends connection request to GPS area information by means of network communication server program port. After the two SOCKETs have been initialized through "Three-way Handshaking", Two SOCKET connections are built on TCP-based convention to begin full-duplex data transmission. At that point, GIS network workstations program sends command "Setting GPS Area Information Return Interim" to network communications server through Attachment connected with the command server of port, and receives GPS area information sent by GPRS vehicle location terminal within certain interval by Attachment connected with GPS area information by means of service port from network communication server program. Finally, GIS community workstations verify the obtained GPS location statistics, automobiles can be displayed as name with specific position at the map through combining with GIS.

B) Network Communications Server

The GIS network workstation and network communication server software is no longer practical, but it is also a vehicle location server. It features a static IP address, three provider ports based on TCP convention and has three sub-services for the framework specifically: command-receiving service, real-time information dissemination services, and GPRS vehicle area terminal communication service. First, the network communications server software program opens the primary connection service port of command-receiving service, and it listens for the connection requests from GIS organize workstation and acknowledges connections, establishes the primary communication interface. After the completion of connection, the communication server program can get "Setting GPS Area Information Return Interim "issued by GIS organize workstations.

At last, the organize communications server program opens the third tuning in port of GPRS vehicle location terminal, it tunes in to connection request from GPRS vehicle area terminal and acknowledges connections, builds information communication interface with GPRS vehicle area terminal. After the completion of connection, the network communication server program can communicate with GPRS vehicle area terminal and transmit command "Setting GPS Location Information Return Interim "issued by GIS organize workstations to GPRS vehicle area terminal, whereas it gets GPS area information bundle returned from GPRS vehicle area terminal.

C) GPRS Vehicle Location Terminal

GPRS vehicle area terminal is composed of GPRS modules and receiving wire, GPS module and radio wire, main circuit framework integration. GPRS module is connected to Web through CMNET to initialize Attachment by TCP convention; it receives the activity connection request to GPRS location terminal communication administrations available in network communications server. After the completion of connection, GPRS module can get command "Setting GPS Area Information Return Interim "issued by GIS arrange workstations from GPRS vehicle area terminal, and it sends back GPS area information parcel to GPRS Vehicle Area Terminal in certain interim. GPS area module is responsible for accepting GPS signals, and getting GPS area information, yielding GPS position data bundles through the serial port by an information bundle per moment.

GPRS vehicle region terminal is composed of GPRS modules and connecting wire, GPS module and radio wire, fundamental circuit system integration. GPRS module is connected to Web through CMNET to initialize Connection by TCP tradition; it takes the connection request to GPRS area terminal communication organizations existed in communications server. After the completion of connection, GPRS module can get command "Setting GPS Zone Data Return Between times "issued by GIS workstations from GPRS vehicle range terminal, and it sends back GPS range data packet to GPRS Vehicle Zone Terminal. GPS range module receives GPS signals and GPS range data, yielding GPS position information bundles through the serial port by a data bundle per minute.

Combination of three-part work standards, we are able see the general framework. To begin with, GIS network workstations sends the command "Setting GPS Location Information Return Interim "to command-accepting service. GPRS vehicle area terminal is responsible for sending the information to GPRS vehicle area terminal .After that, GPRS vehicle area terminal sends back GPS area information to GPRS vehicle location terminal communication administration, and at last, it sends GPS area information to each GIS arrange workstations through real-time information distribution administrations .

EXPERIMENTS

In order to test the feasibility of this system, we performed experiments.

A. Laboratory Equipment

The research facility gear included exploratory car (permit number Ji AR0767), a set of GPRS Vehicle Area Terminal (containing GPRS-enabled mobile SIM card), a server (network communication server program), and a PC (GIS network workstations program), a static Web IP address was connected for server. For the test, we opened three network screen programs to supervise TCP information parcels transmitted from three sub-services, and picked up the particular data counting along with sending IP address and port, getting IP address and port of data parcel.

B. Experimental Procedure

To begin with, GPRS vehicle area terminal was included on the little car and connected to control supply. When the gadget was initialized, IP address of GPRS vehicle location terminal and port were set as settled IP address of the server and GPRS vehicle area terminal communications server port. After initializing, the GPRS vehicle area terminal subsequently connected to GPRS vehicle area terminal communications servers, and set IP address of GIS organize workstations and port comparing to the two communications joins as IP address of organize communications server and comparing two server ports, worked login in, completed the connection of two communications joins in GIS arrange workstations.

At that point, "Setting GPS Location Information Return Interim for 20 Seconds" command is issued from GIS organize workstations, the data packet is received from command server port validation program and GPRS vehicle area terminal communications server port connection monitoring program counting the sender IP address and port, the receiver IP address and port. GPRS vehicle area terminal communication server port network validation program received GPS area information packet transferred from GPRS vehicle area terminal and simultaneously, it received GPS area information packet from GPS area vehicle area terminal communications port validation program and sent to GIS organize workstations. Finally, GIS network workstations program received GPS location data packet, analyzed data packet, and displays the vehicle as a name with specific position at the map through combining with GIS.

CONCLUSIONS

The tests show that vehicle location can be determined on Web remotely by utilizing GPRS vehicle area terminal and combining with Internet innovation and GIS technology. Utilizing this system, we are able track moving vehicle location in a short time, and this framework gives a specialized premise for vehicle tracking management and planning. Currently, GPRS vehicle location network server system is additionally utilized within the military field in addition to socio-economic field. It can track the troops, types of gear and war materials by utilizing GPRS vehicle area network service system in network to achieve quick, accurate, reliable, secure utilization of military security goals. It can be concluded that GPRS vehicle tracker in network system will play increasingly critical part in future information warfare.

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